

SEVERE LOCAL STORMS

[Compiled by Mary O. Souder from reports submitted by Weather Bureau officials]

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
California, ¹ southern San Joaquin Valley and adjoining foothills.	8-10			1	\$250,000	Wind	Much damage to buildings, trees and oil derricks. Flood conditions caused many rural schools to close. Heavy damage was reported to crops by the wind which ripped out thousands of acres of wheat. Citrus trees had their leaves stripped, in many cases. Numerous highways leading to Los Angeles were blocked and, in the vicinity of Santa Barbara, rail travel delayed for several hours.
Rio Grande Valley, Tex. ¹	11					do	Loss in citrus fruits. Reports indicate that as much as 20 percent of the grapefruit crop on the trees was blown to the ground and an equal amount remaining on the trees will be unfit for shipment in fresh-fruit channels.
Eureka, Calif.	14	1:32 a. m.				do	Several fishing vessels sunk or damaged; number of plate-glass windows broken.
Morgan City, La.	14	2:30 p. m.	500	0	500	Tornado	No details.
New Mexico ¹	15					Snow, rain and wind.	Wind reaching a velocity of 75 miles an hour was recorded through Guadalupe Pass in the Guadalupe Mountains, along southern New Mexico-Texas line. In northern New Mexico snow fell over higher altitudes reaching as far south as Santa Fe. About 10 to 15 inches of snow reported in the Taos Questa area near the Colorado line.
Sabine Pass, Tex.	16	3 a. m.			1,000	Straight-line wind.	Property damaged.
Boyce, Tioga and Alexandria, La.	16	11:30 p. m.		1		Thunderstorm and hail.	Man killed by lightning; trees uprooted; power lines damaged.
Atlantic City, N. J., ¹ and vicinity.	16					Wind and rain	Rainfall of 1.78 inches recorded up to 7:30 p. m., with an extreme wind velocity of 53 miles per hour shortly after noon. Bus and automobile traffic somewhat delayed.
Virginia, western portion.	16				3,500	Glaze.	Damage to poles and wires.
Opelousas, La., vicinity of.	26	4:30 a. m.		0		Tornado	5 Negroes injured; 2 houses demolished and 2 others damaged.

¹ From press reports.

SOLAR RADIATION AND SUNSPOT DATA FOR JANUARY 1941

SOLAR RADIATION OBSERVATIONS

By HELEN CULLINANE

Measurements of solar radiant energy received at the surface of the earth are made at 9 stations maintained by the Weather Bureau and at 10 cooperating stations maintained by other institutions. The intensity of the total radiation from sun and sky on a horizontal surface is continuously recorded (from sunrise to sunset) at all these stations by self-registering instruments; pyrheliometric measurements of the intensity of direct solar radiation at normal incidence are made at frequent intervals on clear days at two Weather Bureau stations (Madison, Wis.; Lincoln, Nebr.) and at the Blue Hill Observatory at Harvard University. Occasional observations of sky polarization are taken at the Weather Bureau station at Madison and at Blue Hill Observatory.

The geographic coordinates of the stations, and descriptions of the instrumental equipment, station exposures, and methods of observation, together with summaries of the data obtained, up to the end of 1936, will be found in the MONTHLY WEATHER REVIEW, December 1937, pp. 415 to 441; further descriptions of instruments and methods are given in Weather Bureau Circular Q.

Table 1 contains the measurements of the intensity of direct solar radiation at normal incidence, with means and their departures from normal (means based on less than 3 values are in parentheses). At Lincoln the observations are made with the Marvin pyrheliometer; at Madison and Blue Hill they are obtained with a recording thermopile, checked by observations with a Smithsonian silver-disk pyrheliometer at Blue Hill. The table also gives vapor pressures at 7:30 a. m. and at 1:30 p. m. (75th meridian time).

Table 2 contains the average amounts of radiation received daily on a horizontal surface from both sun and

sky during each week, their departures from normal and the accumulated departures since the beginning of the year. The values at most of the stations are obtained from the records of the Eppley pyrheliometer recording on either a microammeter or a potentiometer.

Total solar and sky radiation was considerably deficient at Washington, Madison, Lincoln, Chicago, Fresno, La Jolla, Riverside, and Blue Hill, and considerably above normal at New Orleans and New York.

Normal incidence measurements at Madison, Wis., the only station reporting, showed a considerable excess in radiation.

No polarization measurements were made at either Madison or Blue Hill, due to snow cover and extreme cold.

TABLE 1.—Solar radiation intensities during January 1941

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.											
Date	Sun's zenith distance										Local mean solar time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	Air mass										
	A. M.					P. M.					
	e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e
Jan. 3	mm.	2.26	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.
Jan. 18	1.12	1.11	1.10	1.34	-----	1.76	-----	-----	-----	-----	2.62
Jan. 30	3.30	.87	.99	1.22	-----	1.81	-----	-----	-----	-----	1.29
Jan. 30	2.16	1.06	1.22	1.31	-----	-----	-----	-----	-----	-----	3.63
Means	-----	1.01	1.13	1.28	-----	(1.78)	-----	-----	-----	-----	2.87
Departures	-----	+ .06	+ .07	+ .08	-----	+ .12	-----	-----	-----	-----	-----

TABLE 2.—Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface

{Gram-calories per square centimeter}

Week beginning—	Washing- ton	Madison	Lincoln	Chicago	New York	Fresno	Cam- bridge	Twin Falls	La Jolla	New Orleans	River- side	Blue Hill	Albu- querque	Friday Harbor	Newport
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Jan. 1.....	182	117	132	111	160	106	147	164	220	176	191	121	279	81	161
Jan. 8.....	203	117	163	78	172	170	174	189	198	267	192	161	240	80	191
Jan. 15.....	144	109	114	97	115	182	127	146	285	263	261	119	310	87	135
Jan. 22.....	98	140	139	49	132	172	162	188	201	271	189	144	251	111	164

DEPARTURES FROM WEEKLY NORMALS

Jan. 1.....	+13	-10	-39	+26	+51	-39	+7	+11	-9	+3	-61	-21	+28	+10	+4
Jan. 8.....	+52	-13	-19	-1	+63	+6	+19	+31	-46	+55	-100	+7	-27	+2	+22
Jan. 15.....	-12	-43	-78	-1	0	+1	-20	-24	+16	+39	-43	-44	+32	-6	-21
Jan. 22.....	-78	-43	-89	-68	-20	-38	-11	+5	-78	+61	-78	-20	-29	+17	-3

ACCUMULATED DEPARTURES ON JANUARY 23, 1941

	-175	-763	-1,575	-308	+658	-490	-35	+161	-819	+1,106	-1,974	-546	+28	+161	+14
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LATE DATA FOR FAIRBANKS, ALASKA

Week beginning—	Total solar radiation	Departures
Dec. 3.....	7	-1
Dec. 10.....	3	-2
Dec. 17.....	13	+6
Dec. 24.....	5	-2

Total departure for the year, +5,243; percentage departure, +6.1.

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.), Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count, are included assumed longitude of center of the disk, assumed latitude of center on the disk, total area of spots and groups, and total spot count.

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- fer- ence in longi- tude	Lon- gi- tude	Lat- itude	Dis- tance from center of disk				
1941	h m		°	°	°	°				
Jan. 1.....	13 33	7096	-46	333	+2	47	6	1	G	U. S. Naval.
		7095	-43	336	+8	45	73	5		
		7094	-41	338	+15	45	66	8		
		7097	-40	339	+9	41	48	2		
		7093	-39	340	+18	44	36	1		
		7094	-38	341	+13	41	97	8		
		7092	-15	4	-8	16	145	7		
		7098	-14	5	+18	25	12	1		
			(19)	(-3)			483	33		
Jan. 2.....	10 47	7096	-33	334	+2	33	24	6	VG	Mt. Wilson.
		7095	-31	336	+8	33	73	7		
		7094	-29	338	+15	34	61	8		
		7097	-28	339	+9	31	48	9		
		7093	-27	340	+18	34	36	5		
		7094	-26	241	+13	31	43	16		
		7092	-3	4	-8	6	48	9		
		7098	-2	5	+18	21	12	1		
			(7)	(-3)			350	61		
Jan. 3.....	11 3	7095	-17	337	+8	20	121	8	VG	Do.
		7094	-16	338	+16	25	121	8		
		7097	-14	340	+9	19	97	12		
		7099	-14	340	-15	19	12	2		
		7094	-13	341	+13	20	97	13		
		7093	-13	341	+19	25	24	3		
		7092	+14	8	-8	15	24	3		
		7098	+17	11	+17	27	12	3		
			(354)	(-3)			508	54		
Jan. 4.....	11 14	*	-22	318	-11	23	24	3	G	U. S. Naval.
		*	-7	333	-14	13	12	2		
		7094	-4	336	+16	20	145	6		
		7095	-4	336	+9	13	73	9		
		*	-3	337	+24	27	12	4		
		7094	-2	338	+14	18	73	8		
		7097	-1	339	+9	12	48	4		
		7093	-1	339	+20	23	36	1		
		7098	+29	9	+19	36	73	4		
			(340)	(-3)			496	41		

POSITIONS, AREAS, AND COUNTS OF SUN SPOTS—Con.

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- fer- ence in longi- tude	Lon- gi- tude	Lat- itude	Dis- tance from center of disk				
1941	h m		°	°	°	°				
Jan. 5.....	12 48	7093	+10	336	+19	25	145	8	F	U. S. Naval.
		7095	+11	337	+10	18	121	5		
		7097	+13	339	+11	20	48	5		
		7094	+15	341	+15	24	97	6		
		7092	+33	359	-8	33	194	9		
		7098	+43	9	+18	49	73	2		
			(326)	(-4)			678	35		
Jan. 6.....	11 56	*	-66	248	+21	70	12	1	VG	Do.
		7093	+23	337	+18	31	121	13		
		7095	+25	339	+10	29	97	8		
		7097	+27	341	+11	31	48	7		
		7094	+29	343	+15	35	97	9		
		7092	+46	0	-9	46	364	10		
		7098	+57	11	+17	60	12	1		
			(314)	(-4)			751	49		
Jan. 7.....	13 1	8002	-84	216	+11	84	194	1	VG	Do.
		8001	-63	237	-10	63	158	10		
		7093	+37	337	+17	42	36	4		
		8000	+39	339	+5	40	121	14		
		7095	+39	339	+10	41	36	10		
		7097	+42	342	+11	44	24	5		
		7094	+43	343	+15	47	48	6		
		7092	+61	1	-9	61	364	10		
		7098	+68	8	+17	70	12	1		
			(300)	(-4)			993	61		
Jan. 8.....	12 56	8002	-70	217	+11	72	170	1	G	Do.
		8001	-49	238	-10	49	170	7		
		*	+42	329	+9	44	24	7		
		8000	+52	339	+5	63	48	5		
		7095	+53	340	+10	66	12	1		
		7097	+56	343	+11	58	12	3		
		7094	+56	343	+14	59	12	3		
		7092	+75	2	-9	75	364	7		
			(287)	(-4)			812	34		
Jan. 9.....	12 14	8002	-56	218	+7	57	97	1	VP	Do.
		8001	-35	239	-10	36	121	3		
			(274)	(-4)			218	4		
Jan. 10....	12 1	8007	-72	189	-4	72	24	3	VG	Do.
		8002	-43	218	+11	46	97	2		
		8001	-21	240	-10	22	170	17		
		*	+17	278	+19	23	12	1		
		8003	+54	315	+3	54	170	13		
			(261)	(-4)			473	36		
Jan. 11....	10 32	8007	-58	191	-4	58	24	3	G	Do.
		8002	-29	220	+11	32	97	1		
		8001	-8	241	-10	11	73	9		
		8005	+6	255	-7	6	24	4		
		8004	+45	294	-10	45	12	1		
		8003	+68	317	+3	69	168	9		
			(249)	(-4)			388	27		

See footnotes at end of table.